

THURSDAY, JANUARY 2, 1879

ROBERT DICK OF THURSO

Robert Dick, Baker of Thurso, Geologist and Botanist.
By Samuel Smiles, LL.D. (London : John Murray, 1878.)

BLEAK and bare, flat and featureless, the county of Caithness lies apart at the far end of Scotland, separated on one side from the rest of the country by rugged mountains and girdled on the other sides by boisterous seas—an unlovely region of brown moor and black morass, partially redeemed to agriculture along the sea-board, but so swept by storm and salt-spray that trees will not grow, save in a few sheltered spots where they have been carefully screened. The solitary mountain group of Morven and the Scarabins, visible from every quarter, lies at the far southern limit of the county, where it seems rather to be part of the uplands of Sutherland, to which indeed in structure it belongs. One redeeming feature, however, can be claimed for Caithness. It is one which compensates, or even more than compensates for the general monotony. The coast-line is almost everywhere formed by a range of mural precipices, rising here and there to heights of 200 and even 300 feet above the waves. Huge massive quadrangular sea-stacks tower out of the water in advance of the main cliff. The sea, moreover, runs inland in innumerable deep dark clefts or "gyoes," and is ever booming in the far recesses of caves that have been worn out of the solid rock by the chafing tides.

The monotony of scenery corresponds with, and indeed depends upon, the sameness of rock underneath. From one end of the county to the other the same interminable dark-grey flagstones in gently undulating beds underlie the scanty soil and peaty morasses. It is these rocks too which, truncated by the sea, run out boldly into headland after headland, or retire into sheltered bays and there extend in reefs upon the shore.

Over the wide Caithness plains the roads run in straight, unvaried lines for miles together. A curious consequence is alleged to be traceable in the physiognomy of the inhabitants. Two acquaintances, advancing along a road from opposite quarters, begin to recognise each other some time before they can actually meet. The smile of recognition is thus prolonged and fixed, so that the people are said to wear a characteristic Caithness grin.

A more unpromising field for the development of natural history tastes it might seem at first somewhat difficult to find within the compass of these islands. No lover of flowers is attracted to settle where short chilly summers and long damp stormy winters make up the year. And where flowers are few insect life will be scanty. Nor is the assemblage of birds likely to be varied where there is neither bush nor tree on which to perch or nest. The waters of these northern seas offer undoubtedly the greatest prospect of reward to the naturalist. They teem with life. Their plants and animals are cast up on the beach by every storm. Every pool on these rocky shores may be made a subject of patient and delightful study.

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It was into the midst of these scenes that in the summer of the year 1830 fortune cast Robert Dick, then a young man of about twenty years. His life had not been altogether a happy one. The son of an officer in the Excise, he had received the ordinary education of a rural district in Scotland, and had shown such aptness at school that there was a proposal to send him to college with a view to his entering one of the learned professions. His father, however, married a second time. Robert's position at home eventually became so uncomfortable that at the age of thirteen he was glad to escape from the paternal roof and become apprentice to a baker in his native village of Tullibody, at the foot of the Ochil Hills. During his school days, and still when employed in distributing bread through the district, he developed an intense love for nature, which remained the master passion of his life. Flowers were his special study in these early years. He knew them in their abode in every bosky dell of his native hills, though as yet he had been able to learn little regarding their scientific names and classification.

With this yearning after wild plants and the scenes amid which they grow Dick came to Thurso (whither his father had already removed) and established himself there as a baker on his own account. His business, however, though he gave very diligent heed to it, did not afford occupation for more than a small part of his time. He was accordingly left with plenty of leisure for making himself acquainted with the natural history of his new home. The sea-shore naturally first attracted him. He wandered for miles along the coast, and collected such shells as he could procure from the beach. But he seems never to have thrown himself with zeal into the study of the marine fauna. His eye, indeed, was ever open, and, with the instinct of a true naturalist, he could recognise the value of facts in departments of knowledge with which he had little practical acquaintance. He ransacked the moors and mosses for beetles, bees, butterflies, and moths, gathering every species and variety he could find, and forming in this way a tolerably complete collection of the insect fauna of Caithness. Eventually he gave himself up, heart and soul, to the flora of the county, traversed on foot every parish and moor from end to end, and formed a herbarium containing not only each species of plant, with its locality and habitat carefully affixed, but also many singular and interesting varieties. He watched the vegetation from season to season, was familiar with the haunts of every species, knew when and where each began to show the earliest budings, traced out the geography of the flora, and marked on what kinds of soil or rock particular varieties were to be found.

It was not until some years after his settlement in Thurso that he began to look into the rocks of the sea-shore. He stumbled upon scales of fishes imbedded within them, which greatly excited his wonder. Further examination brought to light abundant bones and plates, such as he could not find described in any accessible book. He began to collect these fossils, noting particularly the circumstances under which they occurred in the rock, and endeavouring to work out, as well as he could, their peculiarities of structure.

The way in which Dick found time for long excursions, without in anywise neglecting his business, brings out

the wonderful energy and enthusiasm of the man. He would bake his daily supply of bread in the early hours of the morning, have it ready for sale by his faithful housekeeper, and start off himself long before even the earliest riser in Thurso was out of bed. Often would he leave home about midnight, taking advantage of moonlight, and cross the county to reach some special ground for observation by daybreak. Yet he would always get home again in time for the preparation of next day's baking. In this way he would walk sometimes sixty miles or more in a single journey.

Of course such a man could not escape criticism in a small town where everybody knew everybody. And Dick's personal appearance not less than his singular occupations made him a "character" in Thurso. At dusk a tall figure with chimney-pot hat, swallow-tailed coat, jean trousers and travel-stained boots, usually with some bundle of stones, ferns, grass, or what-not, might be seen marching with a swinging pace towards the bakehouse in Wilson's Lane, and the neighbours would watch him as he passed, shrugging their shoulders, and wondering where the poor eccentric baker had been wandering this time. There was no congenial society for him in the place. Though naturally of a sunny hopeful temperament the bitterness of his early life had in some measure soured him; or at least had made him shrink within himself, avoiding the society of others, and finding his companionship among the flowers, mosses and rocks out of doors, and with his books at home. He was a diligent reader, not merely of such books on his favourite pursuits as he could afford to purchase, but of general literature, and in particular of poetry. He had considerable aptitude in quotation and availed himself freely of the gift in his letters. He taught himself drawing, also; turning the acquisition to account not only in the delineation of the objects of natural history which he encountered, but in such excursive subjects as Egyptian antiquities and classical figures, with charcoal outlines of which he would at times adorn the walls of his bakehouse. His artistic taste led him too to procure always the best edition of a book and to put it into the best style of binding.

Dick made Hugh Miller's acquaintance when that eminent writer was at the height of his reputation. There was much in the history and characters of the two men to draw them together. The one had told the whole world his story and had enlisted the sympathy of every reader in the pursuits that had made him famous. Dick on the other hand shrank from notoriety. He told his friend all he knew, showed him all his collections made him welcome to the use of everything, and took him over the ground whence he had quarried many a rare fossil. Such generous help could not but meet with fitting public acknowledgment from its recipient. "He has robbed himself to do me service," said Miller, who fully and frankly stated the nature and extent of his obligations; and then for the first time the geological world heard of the labours of the baker of Thurso. Dick, sitting by his own oven-mouth and reading the allusions to himself in Miller's paper, blushed to find himself thus in print, and begged that he might not be so often mentioned by name: "Leave it to be understood," he writes to Hugh Miller, "who found the old bones; and let them guess who can."

Nevertheless, like many self-taught men, Dick with this avoidance of publicity, united not a little vanity. He was proud of his humble position, and contrasted it with that of the "gentlemen-geologists," who could never do any good work for fear of soiling their clothes. He was proud of his prowess as a pedestrian, losing no opportunity of telling his friends how many miles he had walked and how many hours and minutes he had been on the tramp, while the "gentlemen-geologists" would have been in bed or lazily driving over the ground in gigs. He was proud of his achievements in science, of his power of seizing and sifting facts, of the collections which he had made, of the opinions he had formed. He had indeed much to justify this egotism, though few except the very limited number admitted into his intimacy, knew how much. Hence to ordinary acquaintances, or casual visitors he seemed morose, sarcastic, almost contemptuous. But above these little idiosyncrasies stood out bright and clear, his purity of character, his generous unselfishness, his enthusiasm for nature and his stern conscientious devotion to the daily drudgery of his business. His life was on the one hand a struggle with poverty, and on the other an exuberant communion with the works of God. After fifty-six years of such a life he died, leaving as the result of all his toil just enough of money to defray his debts.

It was well that such a story should be generally known. Dr. Smiles deserves our best thanks for having rescued it from oblivion and thrown it into the form of a volume, made up largely of Dick's own letters. It was fortunate that so many letters could be recovered, for otherwise, as Dick never published anything, and his friends were few, it would have been hardly possible to gather details enough for his biography.

The author has doubtless tried to do his best with the materials at his command, and nobody but he can know the difficulty of his task. But, in spite of the interest of his subject, he cannot be congratulated on having fully sustained in this new venture his well-earned reputation as a biographer. He appears to have taken up the life at intervals sufficiently removed to allow him to forget what he had already written, so that he repeats the same idea, sometimes almost in the same words. We are told three times, for instance, that there is no land between Thurso and Labrador, and twice within the space of three pages that Dick was a favourite with the children of his employer. Dick's habit of Sunday walking is referred to in Chapter XII., and after the lapse of more than a hundred pages it comes up again as if it had never been spoken of before. His baking operations, and how he carried them all on himself, are not likely to be forgotten by any reader of the volume.

More serious fault must be found with the inaccuracies of the book. The author states (p. 98) that "distinguished geologists had asserted that no fossil remains were to be found in the Scotch Highlands," and in support of this assertion he quotes a passage from Conybeare and Phillips's "Geology of England and Wales." The statement is meant to mark the importance of Dick's supposed discovery of fossil fishes in the Old Red Sandstone of Caithness. But a more unfortunate confusion could hardly have been made. In the first place, Caithness is not part of the Scotch Highlands. Geologically and

ethnographically it is a portion of the northern lowlands peopled by Scandinavian colonists. Again, while it is true that the rocks of the Scotch Highlands are with rare exceptions unfossiliferous, no geologist for half a century or more has said that those of Caithness are so also. Dr. Smiles, in repeating, amplifies his assertion (p. 245) and blunders still more; for this time he makes Dean Conybeare the author of the astounding statement that "the rocks of *Scotland* are unfossiliferous!" and drags in Sir Roderick Murchison, "who took the statement on trust," and "many writers" as propagating the delusion. A third time he refers to the subject, when (p. 238) he says "Robert Dick discovered numerous remains of fossil fishes in Caithness where distinguished geologists had stated that no fossil fishes were to be found." How he could print these sentences in the same volume with the letter from Murchison given on p. 275, it is hard to understand. In that letter Murchison speaks of himself as an old geologist who had written upon the Caithness fishes thirty-two years before. In truth, that geologist and his companion Sedgwick had found abundant fossil fishes in Caithness and had published an account with drawings of some of them, while Dick was still an apprentice carrying bread among the villages of the Ochils. No fact in Scottish geology was more familiar than that the flagstones of Caithness abounded in fossil fishes. That Dick should have been filled with surprise when he found them, only shows that he had not had opportunities of learning what had already been done in the district.

Again, Dr. Smiles refers to a remark of Sir Charles Lyell's that "very few organic remains had been found in the boulder-clay and especially in the till, throughout Scotland." It would seem as if he were quoting from a letter of Dick to Hugh Miller; for a passage from this letter follows, showing that the writer had found fossils in the boulder-clay almost in every place where he had looked for them. And the reader is left to draw the inference that Dick in testing Lyell's statement by an appeal to nature, had found it to be incorrect. But it remains absolutely true to this hour. The boulder-clay, as a whole, is singularly barren of organic remains. In one or two exceptional places, and Caithness is one of them, it is full of fragmentary marine shells. Dick's observations were quite accurate; but it was not necessary to enhance their importance by showing that they contradicted the published statements of so distinguished a writer as Sir Charles Lyell.

But the most serious defect of all is one with which it is somewhat difficult to deal. Every reader of the book will recognise that its preparation has been a labour of love. Dr. Smiles has wandered over all the scenes of Dick's rambles, has tried to realise as vividly as possible the circumstances and surroundings of the enthusiast's life, has recognised his devotion to the acquisition of knowledge, and has written with the most heartfelt sympathy with Dick's love of nature and the struggles and trials of his position. And yet one feels that into the spirit of the researches which formed the bright side of Dick's lonely life, which cheered him and furnished him with mental food and recreation from beginning to end, the writer of the Life hardly enters at all. It was more than a mere love of nature which carried Dick so

buoyantly through his monotonous drudgery; more than the mere pleasure of finding flower, or insect, or fossil in its native habitat, and bringing it home to enrich his collection. We have glimpses of this in his graphic letters, and a reader who knows something of the contemporary history of scientific progress, can read between the lines of these letters and find in them an interest tenfold greater than they can possibly have without this information. The want of such assistance to an ordinary reader must make the letters somewhat monotonous, and give the impression that the book is unnecessarily long. When he reads, for example, Dick's account of his numerous and laborious traverses of Caithness in search of sections of boulder-clay, he will naturally ask the object of these toilsome journeys, what was to be gained from them, and what in actual fact was gained. It would have increased his appreciation of these labours to have learnt something of the problem to the solution of which Dick set himself, and he would have been the better able to realise the eager enthusiasm which led that votary of nature to cross the county on foot at night to get to his boulder-clay scars by daybreak. It would have heightened the reader's respect for the subject of the biography to have been shown how, if the results briefly sketched in the letters now published, had been given in detail to the world a quarter of a century ago, they might have placed the name of Robert Dick among the pioneers of glacial geology.

But of all this we learn nothing from the memoir. Dr. Smiles sums up Dick's character and points the moral to be drawn from the story of his life. But what was the outcome of these long years of indefatigable labour? Apart from the man himself, what did his work advantage the world? It is, indeed, a worthy thing to have lived a life that may serve as an ensample and encouragement to after generations. Dick did that nobly. But he did more. He felt that he had "done the State some service." Though he never published his knowledge he worked incessantly and freely communicated his stores of information to others. Much of that knowledge died with him. Yet from his letters, his scientific collections, the published references to the assistance freely given by him to fellow-workers in science, and the recollections of his contemporaries, it might have been possible to have given at least an outline of what he had achieved. Such a sketch would have been a fitting tribute to his memory, a recognition of the meaning and value of those long years of solitary toil.

In an interesting and genially written episode, Dr. Smiles sketches the career of another, but still living enthusiast in natural history—Charles W. Peach, who was one of Dick's most intimate friends, worked with him among the Old Red Sandstone fossils, corresponded, argued, battled with him over their respective opinions. But here again the writer's general sympathy with a heroic struggle for the acquisition of knowledge betrays no special interest in or acquaintance with the life-work of his hero. Unwittingly, therefore, he is led to do but scant justice to his subject. From the allusions, for example, in Dick's letters and elsewhere, to a discussion between that dogmatic observer and Mr. Peach regarding fossil wood, no reader could guess what a momentous point in the history of the Old Red Sandstone of Caith-

ness was really in dispute, and how much Peach's observations went to settle it. No one reading the volume, with its account of Dick's hammerings and Hugh Miller's visits and writings, could surmise that in the paleontology of the Old Red Sandstone of Caithness Peach has done far more than Dick, far more than Hugh Miller, more, indeed, than all other geologists put together.

The illustrations of Caithness scenery, plentifully interspersed throughout the book, are well engraved, and, on the whole, very faithful and characteristic. Nothing could be better than the Deil's Brig of Scrabster Bay. We see the very lichens quivering in the gusts that blow for ever through that hideous cleft, and we hear the screams of the northern sea-fowl as they wheel in restless circles from the neighbouring Clett. In transferring the author's sketches to the wood, however, the artists have taken a few liberties which would have roused poor Dick's indignation. Dirlet Castle, which stands on a rock some twenty or thirty feet above the stream, is raised at least 300 feet into the air; and dear old Morven, glorified into a second Matterhorn, is placed just opposite to Dick's contemptuous ridicule of what the books say about the hill—"None of the hills are as big as books make them"—"d downright nonsense! Morven is accessible on every side."

ARCH. GEIKIE

TELEGRAPHY

Instructions for Testing Telegraph Lines and the Technical Arrangements of Offices. By Louis Schwendler. (London: Trübner and Co., 1878.)

THE criterion of the good working of a line of telegraph is its freedom from interruption. Interruptions to the communication are technically called "faults," and on our overground lines men are stationed at certain intervals for the express purpose of patrolling these lines and removing defects from them that sooner or later might culminate in faults. Of course accidents, such as those arising from snowstorms and violent winds, cannot be prevented, but most of the interruptions that are met with in practice can by proper supervision be eliminated before they can arrive at such a condition as to interfere with the communication. In telegraphy more than in anything else, "prevention is better than cure," and for many years past all our telegraph engineers who have devoted their attention to the proper maintenance of telegraphs have striven to devise as perfect a method as they can for detecting the presence of faults and for establishing an accurate system of testing.

It is, however, upon our submarine cables, not only in their manufacture but during the process of laying, and whilst subsequently working, that the greatest skill and ingenuity has been employed to devise a perfect system of testing.

The first rational mode of testing our cables was introduced by Dr. Siemens, but Mr. Varley had previously introduced into the service of a Telegraph Company a very elaborate system of testing by the aid of differential galvanometers and resistance coils. Rheostats or resistance coils had been invented by Wheatstone as far back as 1843, and Sir Charles Bright and his brother, Mr. Edward Bright, had introduced them into use on the Magnetic Telegraph Company's system. It was, however, in the

telegraph companies' service that the system was to a certain extent perfected, and when all the systems of the different companies were concentrated into the hands of the General Post Office the system became universal for the whole country. We cannot think that Mr. Schwendler, when he asserts that no really practical system of testing had been adopted by any other telegraphic administration than that of India, could have been aware of the perfect system in use by our English administration, and it is a pity that he has not embodied in his book a description of the system in use in England. This perhaps is unnecessary, because it is fully detailed in the "Handbook of Practical Telegraphy," by Mr. Culley, and in the textbook of science on "Telegraphy," by Messrs. Preece and Sivewright. Moreover, there is an excellent little "Handbook of Testing" detailing not only the practice on land lines but on cables also, by Mr. H. R. Kempe, and with another capital little book by Capt. Hoskiaer, on "testing cables," as well as a work on "Electrical Measurements," by Mr. Latimer Clark, leaves very little to be desired on the literature of the subject. Mr. Schwendler really adds little or nothing to our knowledge of the subject, and his book is only valuable as an indication of what has been done in India.

Great strides have been made in the Telegraphic Department in India ever since the accession to power of the lamented Col. Robinson. There is, according to Mr. Schwendler, a large staff of officers available with a first-rate general education and with a strong desire for improvement, and many of them are well trained in conducting physical experiments. It is to be hoped that their education is sufficiently advanced to enable them to follow the rather intricate mathematical developments of Mr. Schwendler. If his book has a defect it is that it is overloaded with mathematical investigations. There is no necessity to appeal to laboured formulæ when simple observations alone are needed to interpret phenomena. The mathematician loves his formulæ as a hen her brood, but the practical man prefers to kick them aside when he can do so and when he can do without them. Now, at p. 16, Mr. Schwendler gives no less than six elaborate formulæ, one of which must be selected for each particular condition to enable the tester to discover the value of any foreign electromotive force that may be in the circuit, the result of what he calls a "natural" current. Now there is no necessity whatever for any formula. The elimination of earth currents in cable and land testing is of daily and constant occurrence, and it is only necessary to compare the deflection upon any galvanometer given by the earth current with a deflection produced by one cell through similar resistance to find its value. Readings by reversals when taken rapidly always give a mean that is approximately true, for an earth current rarely varies so rapidly as to introduce any sensible error. His formulæ for eliminating the electromotive force when measuring with a differential galvanometer simply appal one.

Mr. Schwendler wisely says, "however much testing may become routine by continual practice it will always and should always partake of something of the nature of a physical experiment which must be conducted with a perfectly clear understanding. Then only can the tester draw the right conclusions from his observed facts; then